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10/797,308	03/10/2004	Seela Raj D Rajaiah	70040140-1	4414

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Kathy Manke
Avago Technologies Limited
4380 Ziegler Road
Fort Collins, CO 80525

EXAMINER	
DANIELS, ANTHONY J	
ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
09/24/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

avagoip@system.foundationip.com
kathy.manke@avagotech.com
scott.weitzel@avagotech.com

Office Action Summary	Application No.	Applicant(s)
	10/797,308	RAJAIAH ET AL.
	Examiner	Art Unit
	Anthony J. Daniels	2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _22 June 2007_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _21-40_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _21-40_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment, filed 6/22/2007, has been entered and made of record. Claims 21-40 are pending in the application.

Response to Arguments

1. Applicant's arguments regarding the Haavisto reference and the independent claims have been fully considered but they are not persuasive.

Applicant argues, "Haavisto receives two analog signals from LEDS, logarithmically compresses each signal, subtracts them, and amplifies the difference, all in the white balance unit, and it is this amplified difference that is converted in an A-D converter 56. (See paragraphs 34, 38 and 39.) Clearly, a set of average RGB signals is not generated by Haavisto." The examiner respectfully submits that A/D converter "54" has been relied upon for teaching, not converter "56". Also, Haavisto has simply been relied upon to show that it is known to convert a signal from a photodiode to digital when using it for white balancing. When Haavisto is combined with Abe, an A/D converter is then used in Abe to convert the signals from the photodiodes in Abe's color temperature sensor "120" (see Abe, para. [0023]). Haavisto, alone, is not used to teach generating a set of average RGB signals. <u>Abe, in view of Haavisto</u>, teaches this.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 21 and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US 2001/0030694) in view of Haavisto (US 2001/0007470).

As to claim **21**, Abe teaches an imaging device (Figure 1, digital still camera "100") comprising: a color filter array configured to generate a first set of red-green-blue (RGB) values from light incident upon the color filter array (Figure 3, CCD "116"; [0030], Lines 1-9); a first analog processing and analog-to-digital (A-D) conversion unit configured to receive the first set of RGB values and generate in response thereto, a set of digital RGB signals (Figure 3, A/D "222"); a color sensor that is independent of the color filter array (Figure 3, color temperature sensor "120" separate from the CCD "116"), the color sensor configured to generate a second set of RGB values from light incident upon the color sensor ([0023], Lines 6-9); and a white balance unit that uses intensity values for the RGB values to generate white balance information ([0036]). Although it is not stated explicitly, **Official Notice** is taken that the concept of amplifying signals accumulated on a photo sensor is well known and expected in the art. One of ordinary skill in the art would be motivated to do this, because it produces a more manageable value for processing (*The amplifier is the second analog processing circuit.*). The claim differs from Abe in that it further requires A-D conversion unit configured to receive the second set of RGB values and generate in response thereto, a set of average RGB signals.

In the same field of endeavor, Haavisto teaches a camera (Figure 1) performing white balance on an image taken by an image pickup unit. The camera utilizes a light measuring sensor, separate from the image pickup unit, that provides an overall intensity of the illuminating

light used for balancing the intensities of the color components of the image produced by the image pickup unit ([0037]). The signal representing the overall intensity is accumulated on a photodiode. An analog-to-digital converter (Figure 1, "54") then converts that signal to a digital signal that is then forwarded to a control unit to perform the aforementioned white balancing ([0037]). In light of the teaching of Haavisto, it would have been obvious to convert the RGB signals accumulated in the color temperature sensor of Abe to digital signals before being used for color temperature calculation, because an artisan of ordinary skill in the art would recognize the numerous advantages of utilizing digital signals in calculation.

As to claim **26**, Abe, as modified by Haavisto, teaches the imaging device of claim 21, wherein the first set of RGB values provides pixel-level information of a captured image (see Abe, [0030], Lines 1-9) and the second set of RGB values provides proportion information between the red, green and blue components in light incident upon the color sensor (see Abe, [0023], Lines 6-12).

As to claim **27**, Abe, as modified by Haavisto, teaches the imaging device of claim 26, wherein the proportion information comprises a first voltage representing a proportion of the red component, a second voltage representing a proportion of the green component, and a third voltage representing a proportion of the blue component (*A voltage is inherent in photodiode signal generation.*).

As to claim **28**, Abe, as modified by Haavisto, teaches the imaging device of claim 27, wherein each of the first, second, and third voltages is a DC voltage derived from a supply voltage of the color sensor (see Abe, Figure 3, power switch "308").

As to claim **29**, Abe, as modified by Haavisto, teaches the imaging device of claim 27, wherein the set of average RGB signals generated by the second analog processing and A-D conversion unit comprises a digital representation of each of the first, second, and third voltages (see Haavisto, Figure 1, A/D "54").

As to claim **30**, Abe, as modified by Haavisto, teaches the imaging device of claim 27, wherein the color sensor comprises: a red color filter coupled to a first photo sensor, the red color filter selected to propagate the red component in light incident upon the color sensor; a green color filter coupled to a second photo sensor, the green color filter selected to propagate the green component in light incident upon the color sensor; and a blue color filter coupled to a third photo sensor, the blue color filter selected to propagate the blue component in light incident upon the color sensor (see Abe, [0030], Lines 6-9).

As to claim **31**, Abe, as modified by Haavisto, teaches the imaging device of claim 26. Although it is not stated explicitly, **Official Notice** is taken that color interpolation circuits, which provide RGB values for each pixel are well known and expected in the art. One of ordinary skill in the art would recognize that this would allow a RGB value for each pixel to be obtained without providing 3 separate sensors.

2. Claims 22-25 and 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (US 2001/0030694) in view of Haavisto (US 2001/0007470) and further in view of Ikeda (US 2002/0018129).

As to claim **22**, Abe, as modified by Haavisto, teaches the imaging device of claim 21. The claim differs from Abe, as modified by Haavisto, in that it further requires a color

interpolation unit configured in part, to receive the set of average RGB signals generated by the second analog processing and A-D conversion unit and forward the set of average RGB signals to the white balance unit without further processing, thereby eliminating a processing time in the color interpolation unit.

In the same field of endeavor, Ikeda teaches an apparatus performing white balance. The apparatus also includes a signal processing circuit comprising a color interpolation unit and white balance circuit. Signals used for white balance are forwarded to the signal processing circuit (color interpolation unit) and then to the white balancing unit (Figure 1, [0031]). In light of the teaching, it would have been obvious to one of ordinary to include the color interpolation circuit before the white balance circuit in Abe, because an artisan of ordinary skill in the art would recognize that this would provide the white balancing unit with RGB information for all pixels rather than some, thereby obtaining a truer white balance value.

As to claim **23**, Abe, as modified by Haavisto and Ikeda, teaches the imaging device of claim 22, wherein the set of average RGB signals is a digital set of average RGB signals (see Haavisto, Figure 1, output of A/D "54").

As to claim **24**, Abe teaches an imaging device (Figure 1, digital still camera "100") comprising: a first image processing path comprising: a color filter array configured to generate a first set of red-green-blue (RGB) values from light incident upon the color filter array (Figure 3, CCD "116"; [0030], Lines 1-9); and a first analog processing and analog-to-digital (A-D) conversion unit configured to receive the first set of RGB values and generate in response thereto, a set of RGB signals (Figure 3, A/D "222"); a second image processing path that is parallel to, and independent of, the first image processing path, the second image processing path

comprising: a color sensor that is independent of the color filter array (Figure 3, color temperature sensor “120” separate from the CCD “116”), the color sensor configured to generate a second set of RGB values from light incident upon the color sensor ([0023], Lines 6-9); and a common image processing path comprising: a white balance unit that uses intensity values for the RGB values to generate white balance information ([0036]). Although it is not stated explicitly, **Official Notice** is taken that the concept of amplifying signals accumulated on a photo sensor is well known and expected in the art. One of ordinary skill in the art would be motivated to do this, because it produces a more manageable value for processing (*The amplifier is the second analog processing circuit.*). The claim differs from Abe in that it further requires an analog-to-digital (A-D) conversion unit configured to receive the second set of RGB values and generate in response thereto, a set of average RGB values and a color interpolation unit configured to receive the set of average RGB values generated by the second analog processing and A-D conversion unit and forward the set of average RGB values to the white balance unit without further processing, thereby eliminating a processing time in the color interpolation unit.

In the same field of endeavor, Haavisto teaches a camera (Figure 1) performing white balance on an image taken by an image pickup unit. The camera utilizes a light measuring sensor, separate from the image pickup unit, that provides an overall intensity of the illuminating light used for balancing the intensities of the color components of the image produced by the image pickup unit ([0037]). The signal representing the overall intensity is accumulated on a photodiode. An analog-to-digital converter (Figure 1, "54") then converts that signal to a digital signal that is then forwarded to a control unit to perform the aforementioned white balancing ([0037]). In light of the teaching of Haavisto, it would have been obvious to convert the RGB

signals accumulated in the color temperature sensor of Abe to digital signals before being used for color temperature calculation, because an artisan of ordinary skill in the art would recognize the numerous advantages of utilizing digital signals in calculation.

In the same field of endeavor, Ikeda teaches an apparatus performing white balance. The apparatus also includes a signal processing circuit comprising a color interpolation unit and white balance circuit. Signals used for white balance are forwarded to the signal processing circuit (color interpolation unit) and then to the white balancing unit (Figure 1, [0031]). In light of the teaching, it would have been obvious to one of ordinary to include the color interpolation circuit before the white balance circuit in Abe, because an artisan of ordinary skill in the art would recognize that this would provide the white balancing unit with RGB information for all pixels rather than some, thereby obtaining a truer white balance value.

As to claim **25**, Abe, as modified by Haavisto and Ikeda, teaches a method of imaging (Figure 3, digital still camera "100"), the method comprising: providing a color filter array (Figure 1, CCD "116"); providing a color sensor that is independent of the color filter array (Figure 3, color temperature sensor "120" separate from the CCD "116"); generating a first set of red-green-blue (RGB) values from light incident upon the color filter array ([0030], Lines 1-9); converting the first set of RGB values into a set of digital RGB signals (Figure 3, A/D "222"); generating a second set of RGB values from light incident upon the color sensor ([0023], Lines 6-9), the second set of RGB values being independent of the first set of RGB values (Figure 3, color temperature sensor "120" separate from the CCD "116"); providing a white balance unit ([0036]); receiving in the white balance unit, the set of average RGB signals from the color interpolation unit; and generating in the white balance unit, white balance information from the

set of average RGB signals ([0042]). The claim differs from Abe in that it further requires the steps of converting the second set of RGB values into a set of average RGB signals; providing a color interpolation unit; propagating the set of average RGB signals through the color interpretation unit without processing in the color interpretation unit, thereby eliminating a processing time in the color interpolation unit.

In the same field of endeavor, Haavisto teaches a camera (Figure 1) performing white balance on an image taken by an image pickup unit. The camera utilizes a light measuring sensor, separate from the image pickup unit, that provides an overall intensity of the illuminating light used for balancing the intensities of the color components of the image produced by the image pickup unit ([0037]). The signal representing the overall intensity is accumulated on a photodiode. An analog-to-digital converter (Figure 1, "54") then converts that signal to a digital signal that is then forwarded to a control unit to perform the aforementioned white balancing ([0037]). In light of the teaching of Haavisto, it would have been obvious to convert the RGB signals accumulated in the color temperature sensor of Abe to digital signals before being used for color temperature calculation, because an artisan of ordinary skill in the art would recognize the numerous advantages of utilizing digital signals in calculation.

In the same field of endeavor, Ikeda teaches an apparatus performing white balance. The apparatus also includes a signal processing circuit comprising a color interpolation unit and white balance circuit. Signals used for white balance are forwarded to the signal processing circuit (color interpolation unit) and then to the white balancing unit (Figure 1, [0031]). In light of the teaching, it would have been obvious to one of ordinary to include the color interpolation circuit before the white balance circuit in Abe, because an artisan of ordinary skill in the art

would recognize that this would provide the white balancing unit with RGB information for all pixels rather than some, thereby obtaining a truer white balance value.

As to claim **32**, Abe, as modified by Haavisto and Ikeda, teaches the method of claim 25, wherein generating the first set of RGB values comprises generating pixel-level information of a captured image ([0030], Lines 1-9) and generating the second set of RGB values comprises generating proportion information between the red, green and blue components in light incident upon the color sensor ([0023], Lines 6-12).

As to claim **33**, Abe, as modified by Haavisto and Ikeda, teaches the method of claim 32, wherein generating of proportion information comprises generating of a first voltage representing a proportion of the red component, generating a second voltage representing a proportion of the green component, and generating a third voltage representing a proportion of the blue component (*A voltage is inherent in photodiode signal generation.*).

As to claim **34**, Abe, as modified by Haavisto and Ikeda, teaches the method of claim 33, wherein converting the second set of RGB values into the set of average RGB signals comprises generation of a digital representation of each of the first, second, and third voltages (see Haavisto, Figure 1, output of A/D "54").

As to claim **35**, Abe, as modified by Haavisto and Ikeda, teaches the method of claim 33, further comprising: coupling a DC voltage into the color sensor; and generating the first, second, and third voltages from the DC voltage (see Abe, Figure 3, power switch "308").

As to claim **36**, Abe, as modified by Haavisto and Ikeda, teaches the method of claim 33, wherein providing the color sensor comprises: coupling a red color filter to a first photo sensor, the red color filter selected to propagate the red component in light incident upon the color

sensor; coupling a green color filter to a second photo sensor, the green color filter selected to propagate the green component in light incident upon the color sensor; and coupling a blue color filter to a third photo sensor, the blue color filter selected to propagate the blue component in light incident upon the color sensor (see Abe, [0023], Lines 6-12).

As to claim **37**, Abe, as modified by Haavisto and Ikeda, teaches the method of claim 32. Although it is not stated explicitly, **Official Notice** is taken that color interpolation circuits, which provide RGB values for each pixel are well known and expected in the art. One of ordinary skill in the art would recognize that this would allow a RGB value for each pixel to be obtained without providing 3 separate sensors.

As to claim **38**, Abe, as modified by Haavisto and Ikeda, teaches the imaging device of claim 24, wherein the first set of RGB values provides pixel-level information of a captured image (see Abe, [0030], Lines 1-9) and the second set of RGB values provides proportion information between the red, green and blue components in light incident upon the color sensor ([0023], Lines 6-12).

As to claim **39**, Abe, as modified by Haavisto and Ikeda, teaches the imaging device of claim 38, wherein the proportion information comprises a first voltage representing a proportion of the red component, a second voltage representing a proportion of the green component, and a third voltage representing a proportion of the blue component (*A voltage is inherent in photodiode signal generation.*).

As to claim **40**, Abe, as modified by Haavisto and Ikeda, teaches the imaging device of claim 38. Although it is not stated explicitly, **Official Notice** is taken that color interpolation circuits, which provide RGB values for each pixel are well known and expected in the art. One

of ordinary skill in the art would recognize that this would allow a RGB value for each pixel to be obtained without providing 3 separate sensors.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J. Daniels whose telephone number is (571) 272-7362. The examiner can normally be reached on 8:00 A.M. - 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AD
9/13/2007

TUAN HO
PRIMARY EXAMINER